

Light and Lighting

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Illuminating
Engineering
Society

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A Link With The Past

A LINK with the Past—with Early Days of Illuminating Engineering—has been severed by the loss of Mr. A. P. Trotter, whose death at the age of 91 is reported on page 143.

Mr. Trotter was a leader of the small band of enthusiasts responsible for the starting of the I.E.S. His support was of inestimable value in those early days—nearly forty years ago—when illuminating engineering was a new conception.

Mr. Trotter held an entirely independent position. His interest in illumination was purely scientific and intellectual. He was far in advance of his time. The now famous paper, read by him before the Institution of Civil Engineers in 1892, included an analysis of the problem of street lighting, and a description of an instrument for measuring it, certainly the first illumination photometer in practical use in this country and, perhaps, the first in the world.



I.E.S. Convention ; Published Proceedings

A full account of the proceedings at the I.E.S. Convention held in London in May, 1946, is now available. The booklet, which occupies over 100 pages, is fully illustrated and contains the complete series of papers read, together with general notes on the proceedings and summaries of the popular talks given on the opening evening.

It will be recalled that the main papers read were as follows:—

“New Lamps for Old” (L. J. Davies),

“Laboratory Technique in Solving War-time Visibility Problems” (W. R. Stevens and J. M. Waldram),

“Some Developments in Airport Ground Lighting” (S. English).

“Daylight and Town Planning” (W. A. Allen),

“Fluorescent Lighting Practice” (W. J. Jones).

Besides the account of papers and addresses, the volume contains references to the exhibition, the dinner, the informal social evening, and other events. In fact it presents an excellent memento of the event. Copies of these proceedings (which are issued separate from the Transactions), have been circulated to all members.

We are asked to say that additional copies can be obtained at 10s. each (six copies £2 10s.; 12 copies £5).

Illuminating Engineering in Australia

A short time ago we referred to the development of the Illuminating Engineering Societies in Australia and their constitution under a national council. From information recently furnished by Mr. H. G. Fallon, the National President, we get a further glimpse of progress. The main bodies thus linked, with headquarters in New South Wales, Victoria, South Australia and Western Australia, have, respectively, 256, 233, 89 and 113 members. To these are to be added the 103 members in the Queensland division, likely to be ranked with the other four bodies under the national constitution in the near future, and the separate chapters in Hobart and Launceston (Tasmania). The total membership thus accounted for was recently given as 867, so that the societies as a whole are approaching the 1,000 mark.

The operation of the bodies under the common constitution seems to be working quite smoothly. This constitution, which is supplementary to the local rules of the societies involved, is a somewhat elaborate document, no doubt necessarily so in view of the fact that it unites bodies which grew up spontaneously and independently, instead of being formed under the aegis of the main body as is the case with I.E.S. Centres in this country.

A.P.L.E. Annual Meeting and Conference

The nineteenth Annual Meeting and Conference of the Association of Public Lighting Engineers will take place in Southport during September 15-19, where the headquarters of the Association will be at the Prince of Wales Hotel. Meetings will be held in the Cambridge Hall.

On the evening of the opening day (September 15) there will be a reception by the Mayor of Southport, and the new President (Mr. Thos. Wilkie) will be inducted.

Mr. Wilkie's Presidential Address will be delivered on the following morning, after which the Conference will commence. The papers in prospect include:—

Street Lighting in relation to Safety, Traffic Problems, and Crime Protection (A. E. Marchant and Robert Bell).

The Maintenance of Street Lighting (J. Woodhouse).

Photometry in relation to Public Lighting (Dr. S. English).

The Lighting of Class "B" Side and Residential Roads (R. W. Steel).

The Royal Fine Art Commission and Lamp Columns (A. B. Knapp-Fisher).

On Wednesday, September 17, the Conference Luncheon will be held, and on the evening of Thursday, September 18, there will be a Reception by The President, followed by a dance and entertainment. The final day, Friday, September 19, is to be devoted to a coach tour via Liverpool, permitting inspection of the lighting of the Mersey Tunnel, etc.

Opportunities will be provided for the inspection of public lighting installations in and around Southport.

"ROSPA" Silver Jubilee Congress

The Royal Society for the Prevention of Accidents ("ROSPA") will be holding its Silver Jubilee Congress in Brighton during October 7-10.

Special attention will be devoted to the Government's Road Safety Campaign, but there will also be a session devoted to Home Safety.

It is hoped that the plan for Road Safety will be outlined by Mr. G. R. Strauss (Parliamentary Secretary to the Ministry of Transport). The Minister of Education (Mr. Tomlinson) and the Home Secretary (Mr. Chuter Ede) are also expected to address the Conference. The Congress will, as usual, be reinforced by an Exhibition.

The Presidential Address will be delivered by the Rt. Hon. Lord Llewellyn.

Proposed I.E.S. Sussex Group

Members of the I.E.S. who are resident in Sussex will be interested to hear of the proposal to form a new I.E.S. Group with a headquarters in Brighton. This is the first attempt to establish a group in the South-Eastern area and, if successful, it will no doubt be followed by others.

As a first step, a preliminary meeting to discuss the proposal is being arranged to take place in Brighton during the second week in September. Members of the I.E.S. and any others who are interested in lighting matters are invited to communicate with Mr. O. E. Guyatt, of 12, Silchester-road, St. Leonards-on-Sea, or with Mr. A. Sacre, of 14, Adversane-road, Worthing, for final details regarding date, time, and place.

Birmingham I.E.S. Centre

The latest "news letter" recently circulated to members of the Birmingham I.E.S. Centre contains several interesting items. Reference is made to the final paper of last session by Mr. H. J. Cull on "The Physical Nature of Light," which seems to have gone deeply into the theoretical aspects, but was very well received, and to the annual outing on July 9, which included a visit to New College, Oxford.

The programme for next session is well advanced and is to include one new feature, a ladies' evening. We note that arrangements have now been concluded for the Course in Illuminating Engineering, to take place at the Central Technical College, Suffolk-street, on September 22. Applications for enrolment will be received in the week beginning September 8.

Deterioration in Vision?

A point made in the address of the present I.E.S. President (Mr. J. S. Dow) a few months ago finds confirmation in a paper recently presented by Arthur D'Ombrian to the Hobart Chapter of the I.E.S. of Australia. The author, a Fellow in Ophthalmology of the Royal Australian College of Surgeons, rejects the assumption, so often made, that "poor illumination causes deterioration of the sight"—though it can do enough harm in all conscience by causing fatigue, accidents, inefficiency, and general discomfort. Even eyestrain, to which poor illumination may be a contributing factor, does not in itself produce permanent

damage to sight. Poor illumination can only cause actual damage to the eyes through quite exceptional and extreme conditions—such as intense glare, leading to photophthalmia, or such insufficiency as occurs in mines, causing nystagmus. Exposure to certain forms of short-wave ultra-violet radiation may also cause inflammation, but this is not present in any appreciable degree in ordinary illuminants. As illumination and vision are so intimately related, there is good ground for desiring the co-operation of eye-doctors with lighting experts. Recognition of the above factors, however, removes the most urgent claim for their attention.

Light and Lighting

Increase In Subscription

Reference was recently made in these columns to the changed conditions from which technical journals have been suffering during recent years, including the great increase in the costs of production, notably the increased costs of paper and printing, both very much higher than before the war.

During this period no change has been made in the subscription to *Light and Lighting*, which has remained the same as in pre-war days.

It has become evident, however, that this is no longer possible. Accordingly from January 1, 1948, onwards the price of single copies will be One Shilling and the annual subscription Fifteen Shillings.

50 Per Cent. of Street Lighting

The permission to restore street lighting to 50 per cent. of its pre-war value comes into effect with the end of double summer time on August 10. Apparently the public lighting engineer is free to effect this saving in any way he chooses. He will no doubt see that main streets carrying much traffic are relatively well lighted. Economies have to be made elsewhere, but there should be no sudden changes. Experts and the public agree that anything is better than alternate bright patches and pools of darkness.

In the meantime it is well to note that, as was recently stressed by the A.P.L.E. deputation to the M.O.T., the estimated saving for the entire country is small, possibly 200,000 tons of coal and less than $\frac{1}{2}$ per cent. of the total fuel output. It may be argued that, if one thinks of the anticipated gap between output and consumption the proportion is not so small. But even so better avenues for saving exist. It seems to be recognised that the object of the cut is partly psychological—the public might be dissatisfied if they observed that public lighting was being maintained at its full pre-war value. Such considerations have been largely responsible for unreasonable gloom during the blackout and afterwards. In principle it seems clearly wrong for authorities to yield to mistaken popular impressions, and it is up to those interested in public lighting to ensure by judicious propaganda that the public mind is led to form a juster appreciation of the position.

Flame Proof Fittings

Attention may be drawn to the revised version, recently issued, of the British Standard Specification for Flame Proof Electric Fittings (B.S. 889)*. It applies to coal mines or other places where inflammable gas or vapour may be present. Maximum permissible gaps for flame-proof joints and other information is included, and in the 1947 version dimensions for six sizes of well glasses, which it is recommended should be adopted as standard, are given.

The Professional Engineers Appointments Bureau

In order to obviate any possibility of its name being infringed the above-mentioned Bureau has been incorporated as a company under limited guarantee. The scope of the Bureau remains unaltered, and members who, by reason of their engineering qualifications, belong to the Institution of Civil Engineers, the Institution of Mechanical Engineers, or the Institution of Electrical Engineers or persons whose engineering qualifications for election or admission to one of those bodies have been approved by the respective councils are invited to register. The necessary forms may be obtained on application to the Registrar of the Bureau, at 13, Victoria-street, Westminster, S.W.1. A stamped addressed foolscap envelope should be enclosed.

* Obtainable from the Sales Dept., British Standards Institution, 24, Victoria-street, London, S.W.1; price 3s. post free.

International Conference on Colour Vision

Cambridge: July 28 to August 2,
1947

Research workers on vision and others closely interested—to the number of 115 in all—assembled in Cambridge on July 28 to take stock of current ideas on colour perception. Sir John Parsons, in opening the Conference, specially welcomed the many leading investigators from abroad who were present.

The first paper was read by Dr. Wright (London), who reviewed the recurring tribulations of the trichromatic theory, recently much shaken by the discovery, by electrophysiological methods, of narrow (modulator) spectral response curves and by the new sensory data on colour vision in small fields. His general conclusion was that some form of trichromatic theory had to be adopted to explain some of the experimental results and that such a theory was not inconsistent with much of the remaining data.

Prof. Granit (Stockholm) discussed our present knowledge of the electrical response of the retina to light, as observed by the microelectrode technique. In this technique, the electric pulses transmitted to the brain by single nerve fibres in the retina are picked up by applying a microelectrode to the retina of an experimental animal, the cornea and lens of the eye having first been removed. Although the microelectrode in successful trials makes contact with only one nerve fibre, the latter is connected to a ganglion cell, which, in general, receives pulses, via intermediary bipolar cells, from several end-organs (rods and cones). Prof. Granit found that the spectral sensitivity curves of individual fibres—determined from the smallest intensities of monochromatic stimuli necessary to produce a minimal electrical response—fell into two main classes: broad, so-called *dominator*

curves which could be related to the photopic and scotopic luminosity curves observed in sensory measurements, and narrow *modulator curves* with maxima located at various points of the spectrum from the violet to the red. The modulator curves must, it seems, have an important role to play in colour perception, but, so far, no close relation with spectral sensitivity curves obtained by subjective observations has been established.

It was clear that Prof. Granit inclined to the view that brightness and colour sensations are separate in a very real physiological sense and that in direct comparison heterochromatic brightness matching we are able to base our adjustment on the response of the dominators ignoring that of the modulators. In the latest work by the microelectrode method (Granit and Gernandt), it has been found that by passing a polarising current through the retina the individual fibres transmit nerve pulses to the brain just as though the retina had been illuminated. By comparing the electrical responses of a fibre (a) to polarising currents (direct and reverse) in the dark, (b) to monochromatic stimuli in the absence of a polarising current, (c) to monochromatic stimuli during the action of a polarising current, deductions can be drawn as to the way in which the response of the fibre depends on the properties of the end-organs to which it is connected.

Considerable attention was paid during the Conference to the properties of colour defectives. Prof. Hecht (Columbia University, New York) showed that for colour defectives the effective luminosity of a given brightness of white light was lower than for the normal eye, by about 50 per cent. for protanopes and about 40 per cent. for deuteranopes. This result was arrived at in two ways: (a) by comparing the threshold sensitivities for foveal vision of a 1 deg. stimulus on a dark field, (b) by comparing visual acuities at high brightnesses.

Both Dr. Judd (Bureau of Standards, Washington) and Prof. Hecht considered that the main difficulty in interpreting dichromatism on the usual trichromatic basis lay in explaining the descriptions of their colour sensations given by colour-blinds, in particular, by subjects possessing one normal and one defective eye. Although anomalous trichromats, unlike dichromats, cannot be regarded as possessing simple reduced forms of normal colour vision, evidence was submitted by Dr. Pitt (London) and Dr. Schouten (Eindhoven), suggesting that the anomaly might be attributable to a distortion of only one of the three fundamental response curves. The Ishihara plates and other similar colour-vision tests are not suited to the detection of tritanomalous observers and a special pseudo-isochromatic plate for this purpose shown by Commander Farnsworth (New London, U.S.A.) was of particular interest. New material on the luminosity curves of colour defectives obtained with small fields and central foveal vision was presented by Dr. Willmer (Cambridge). He showed how the measurements could be interpreted in terms of the hypothesis on retinal structure put forward in his recent book.

Brightness and colour discrimination were discussed by Dr. MacAdam (Rochester, U.S.A.), who gave results showing how the relative importance of colour contrast compared with brightness contrast diminishes in passing from large to small angular areas of the stimuli.

Dr. Farnsworth, commenting on the investigation by Mr. J. G. Holmes (London) of the distinguishability and correct naming of signal lights of different colours, emphasised how valuable these results had proved during the war in dealing with a number of Service problems.

Professor Hartridge (London) developed his polychromatic theory of vision, parts of which came under criticism. While the need for recognising more than three distinct colour sensations was

generally admitted, the arguments for more than three mechanisms of colour vision appeared less cogent.

As in most conferences, informal talks after the meetings were as valuable to those participating as the meetings themselves. They were greatly facilitated by the accommodation of most of the visitors in Clare College. Dr. Willmer, who did most of the work of organisation, is to be congratulated on the arrangements made.

Mr. Percy Good: I.E.E. President

Members of the Illuminating Engineering Society will note with pleasure the election of Mr. Percy Good as President of the Institution of Electrical Engineers.

Few people can have become more widely known than is Mr. Good through his life-work for the B.S.I., but he has other interests, as is illustrated by his valuable work for the I.E.S., of which he was President in 1938, and for which he this year consented to become Hon. Treasurer for a second period. He took a leading part in the organising of the I.C.I. Congress, held in this country in 1931. During the last war he was mainly responsible for the liaison between the I.E.S. and the Ministry of Home Security, which enabled the Society to do such useful service.

The Luminometer

F.I.A.T. Final Report No. 871 (H.M. Stationery Office, price 1s. net) contains an account of a new visual photometer, called the luminometer, which was developed in Germany in 1942 by Carl Zeiss with the object of measuring very faint brightnesses.

The accuracy of this instrument as compared with that of ordinary photometers is claimed to be about three times greater. It has a field of view of 30 deg. and an exit pupil 9 mm. in diameter.

The Artificial Sky: Its Value in Building Design



A view of the canopy, illuminated by artificial light sources, which serves as an "artificial sky" at the Royal Technical University in Stockholm.

In this country use has occasionally been made of models receiving light from a diffusing area above, in predicting the admission of daylight, and in similar problems. Through the courtesy of one of the I.E.S. members in Sweden, Mr. Gunnar W. Pleijel, we present the above view of an "artificial sky" apparatus, designed for the Royal Technical University in Stockholm, where a special daylight laboratory, operating with the aid of a grant from the State Committee on Building Research, is now available. The sky is so designed as to have an even brightness (within an error of ± 2 per cent.) over its entire area. By its aid daylight problems in all sorts of buildings, including factories with high side

lights and with rooflights of various types can be readily studied.



The observer at work on a model structure receiving the equivalent of daylight from above.

Obituary

ALEXANDER PELHAM TROTTER

Born: June 25th, 1857

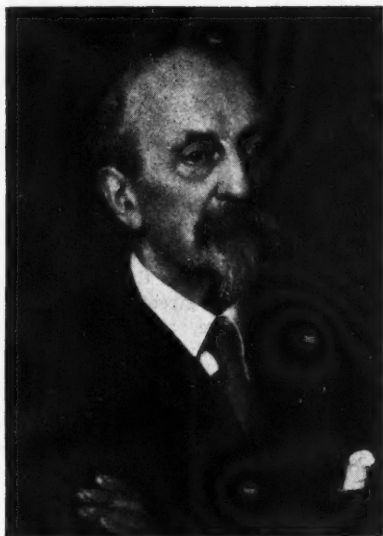
Died: July 23rd, 1947

It is with deep regret that we record the death of Mr. Alexander Pelham Trotter, at the ripe age of 91 years.

Mr. Trotter, during his long and distinguished career, played many parts. After early experience in dynamo manufacture he became editor of *The Electrician*, served as Government electrical engineer for the Cape of Good Hope, became electrical adviser to the Board of Trade, and, after retirement, joined the firm of Handcock and Dykes, consulting engineers.

He was a member of the Institution of Civil Engineers, the Institution of Electrical Engineers (before whom he delivered the Faraday lecture in 1926), the Physical Society, and other bodies. But by I.E.S. members he will be remembered chiefly for his devotion to the Illuminating Engineering Society, of which he was one of the original members, of which he was President during the years 1917 to 1920, and in which he continued to take a keen interest almost up to the last.

Amongst his contributions to the literature of illumination, great interest attaches to his paper entitled, "The Distribution of and Measurement of Illumination," read before the Institution of Civil Engineers in 1892, which was awarded the Telford Medal and premium. This paper, including as it does a description of an illumination photometer and its application to the measurement of street lighting, was a remarkable achievement at that early date. Other contributions dealt with the electric arc and the design of dioptric glassware. He was responsible for two books that are still classics, "Illumination: Its Distribution and Measure-



Alexander Pelham Trotter
(I.E.S. President: 1917—1920)

ment" and "The Elements of Illuminating Engineering."

Following the outbreak of war in 1914, Mr. Trotter advised on war-time street lighting, making observations from a balloon for the purpose, and was chairman of the I.E.S. Committee which conducted tests of parachute flares, etc., for the Department of Trench Warfare. When the war was over he led the deputation of I.E.S. members which paved the way for the committee on Illumination Research, operating under the Department of Scientific and Industrial Research.

Mr. Trotter's value to illuminating engineering in those early days was enhanced alike by his high scientific reputation, by the independent position he occupied, and by his unique personal disposition. He combined a natural dignity with an unaffected simplicity, courtesy, and kindness of heart which won the esteem of all with whom he came in contact. A great figure in the field of illuminating engineering has passed away.

The Development and Trend of Street Lighting by Electricity*

by

N. BOYDELL, M.I.E.E., A.M.I.Mech.E.

In this paper the author, who is the Borough Electrical Engineer and Manager at Eastbourne, points out that though traffic conditions have altered out of all recognition in the past thirty years much of our street lighting has remained the same, and only recent installations which have been designed in the light of experience can claim to be really good.

The paper refers to the development of lamps for street lighting from the earliest form of arc lamp to the recent application of tubular fluorescent lamps. It is suggested that the best use of this latter form of lighting is in busy shopping areas, particularly narrow streets, and in civic centres where strict economy of fittings and light output is not necessary, and where the desire is to create a well-lighted appearance of the whole area, including the fronts of buildings and pavements. In other circumstances it is considered unlikely that other forms of discharge lighting will be replaced by this new form of lighting.

Various suggestions had been put forward from time to time in regard to the mounting and placing of street lighting equipment, all of which are dismissed as impracticable; combinations of searchlights and barrage balloons are dependent on the weather; dwarf types of columns would mean uneven illumination, and a very low brightness of glare is to be avoided, whilst kerb lighting has been proved by demonstration to be inefficient, particularly in wet weather.

In discussing the more orthodox methods of suspending lanterns the author mentions that in many towns where there are overhead tram and trolley-bus wires the poles for these are used for street lighting on the grounds

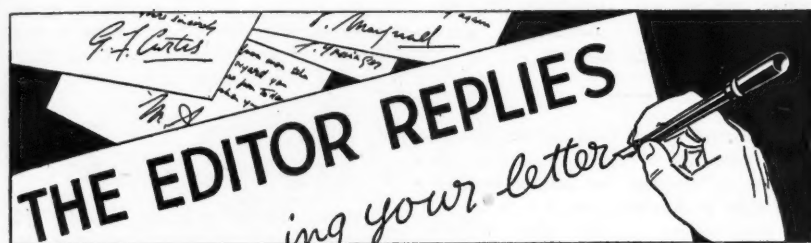
of economy. It is felt that this can never be really satisfactory as the spacing will in many cases be unsuitable, and the method can never be anything better than makeshift. The author expresses the hope that such overhead systems will soon cease to exist, and recalls that in Paris overhead wires are not allowed in public streets.

Interest in street lighting has been very largely stimulated in recent years, partly by the changed traffic conditions and the rate of road accidents, and also by the advent of the electric discharge lamp. The view is expressed that for the lighting of any roads, other than those in main shopping streets and civic centres, no authority is justified at present in not accepting, on the grounds of colour distortion, the advantages of plain mercury discharge or sodium vapour lighting. In the vicinity of public buildings the lighting arrangements should be in conformity with surroundings, should be dignified and, to a certain extent, ornamental. Consideration should also be given to the daylight appearance of installations, a point which is often overlooked or ignored.

There should also be as much co-operation as possible between town-planners, those responsible for road construction, and those responsible for designing the lighting installation. The actual road surfaces present a problem, as the road engineer wants a surface that is durable and non-skid, whilst the lighting engineer wants one that will give maximum diffusion of reflected light. The author also stresses that each lighting authority should be advised by a competent street lighting engineer.

In conclusion, Mr. Boydell points out that good street lighting is an indication of civic pride, and even of prosperity, in any town. A good street lighting installation in the most important streets, besides providing adequate illumination at night enhances the appearance of those streets in daylight, as a minor form of architecture. New residents and visitors notice, and are attracted to, a town where the street lighting is of a high standard, and the value of property is not only thereby increased but other improvements are encouraged.

* Summary of a paper read to the Public Works, Roads, and Transport Congress, July 22, 1947.



I understand from Mr. J. S. Preston, the general secretary of the I.C.I., that the reference to the **Proceedings** of that body in our July issue (p. 126) was not quite accurate in one respect. The volumes of the 1939 Proceedings already printed include all the Secretariat Reports, as well as the individual papers. Copies are on the point of dispatch to such National Committees as have not yet received them. Only the minutes and principal decisions remain to follow in the volume to come.

Some little time ago there were many anxious to find **Jobs** and few offered. At the moment the position seems on the way to being reversed. The attention of readers—and also of any of those who have previously advertised their need for situations and are not yet suited—is drawn to the series of openings under "**Situations Vacant**," advertised on p. 146.

The urgent demands for fuel economy, and the consequent restrictions placed on public lighting, lead one of our correspondents (Mr. C. L. Jackson) to revive the idea of providing diffused **illumination in the streets** of cities by means of **searchlights**, the beams of which were often reflected from clouds with striking effect during the war.

Public lighting experts have frequently dismissed this alternative to

ordinary methods of street lighting, pointing out that it is essentially uneconomical and capricious in effect, being so dependent on the presence of low-lying clouds to reflect the light and so readily spoiled by unfavourable atmospheric conditions, such as a clear sky on the one hand or mist and fog on the other.

On the ground of fuel economy, it may be urged that the use of searchlights fed by an oil-driven set means some economy in coal. On the other hand it will, in fact, be found that the power consumed by a single searchlight would suffice for quite a considerable number of street lights. And, even the consumption of oil may also, in due course, become a consideration. Finally the recently accorded permission to use 50 per cent. of pre-war street lighting seems to deprive this argument of much of its urgency.

The offer to print information of **novelties in lighting** in our June issue (p. 115), reinforced by appeals to leading firms in the lighting industry, does not seem to have brought much response. I have, however, been advised of two little items of news.

At the moment of writing I am informed that the London County Council is now carrying out a scheme for the improvement of the **lighting of Vauxhall**

Bridge, which will comprise fourteen 400-watt mercury discharge lamps mounted at a height of 25 ft.

The second bit of information relates to the proposal of the Edinburgh Corporation to arrange for **public football pitches to be floodlit**, which it is hoped will permit play to take place on six nights in the week.

The above presumably applies to amateur play. The desire of the Government to curtail mid-week sporting crowds, however, which may lead to the restriction of mid-week football during next season, has also redirected attention to the possibilities of floodlighting so that professional matches may take place by night. There are, however, as we have pointed out previously, evident drawbacks to out-of-door entertainments on winter nights. The ideal solution would be football on an artificial playing surface in a **large artificially lighted and heated indoor covered area**. This may come in course of time.

One learns with interest that our I.E.S. is likely to be well represented at the forthcoming convention of the American I.E.S. Amongst those who are expected to attend are Mr. J. M. Waldram, whose experience of street lighting and other problems should be interesting to our friends across the Atlantic, and Mr. Alan H. Owen.

Mr. L. G. Applebee has given me some interesting particulars of his recent trip to the U.S.A., in the course of which he lectured on two occasions, to the New York Section of the I.E.S., and to the students of the department of drama at Yale University. He also learned much about current American practice in

theatre lighting, and was able to assist the preparatory work being done in this field in connection with the I.C.I. Conference in Paris next year.

SITUATIONS VACANT

Messrs. **EKCO-ENSIGN ELECTRIC** have openings at their London, Birmingham, Glasgow and Preston Offices for experienced **ILLUMINATING ENGINEERS**. Salary fully commensurate with experience and qualifications, written details of which should be sent in the first instance to Mr. F. L. Cator, 5, Vigo-street, London, W.1.

DESIGNERS having not less than ten years' experience in originating and designing lighting equipment are invited to apply for a senior appointment in Central London. Proof of engineering, design, and styling ability must be produced. Write, stating age and salary required to "**LIGHTING SECTION**," The Edison Swan Electric Co., Ltd., 155, Charing Cross-road, London, W.C.2.

DESIGNER - DRAUGHTSMAN required for design and development of all classes of electric light fittings. Should be capable of preparing working drawings for production. Write, stating age, previous experience and salary required to Box 768 "**Light and Lighting**," 32, Victoria-street, London, S.W.1.

ILLUMINATING ENGINEER, 25-35 years, conversant with modern lighting practice and able to plan complete schemes for industrial and exterior lighting, required by E.L.M.A. company in London. Applications, giving full particulars of experience, qualifications, age and salary desired to Box 767, c/o. "**Light and Lighting**" 32, Victoria-street, London, S.W.1.



THE £.S.d OF STREET LIGHTING

Economy and efficiency loom large in the work of Municipal Lighting Engineers, and often they are uneasy partners. Ratepayers have the right to expect full value for money expended on public lighting, and full value means maximum efficiency for the most economical outlay.

STREET LIGHTING with MAZDA LAMPS ensures both efficiency and economy. BTH Public Lighting Engineers are always ready to place their experience and technical knowledge at the disposal of Municipal officers. Enquiries should be addressed to BTH Lighting Advisory Service, Bridle Path, Watford. Telephone: Watford 7701/8.



MAZDA
LAMPS

IN

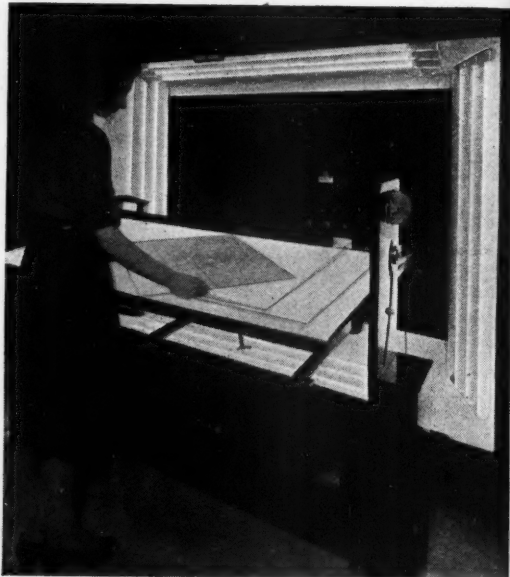
MAZDALUX
LANTERNS

The British Thomson-Houston Co. Ltd., Crown House, Aldwych, London, W.C.2

A New Use for Fluorescent Lamps

This convenient apparatus (the "Barcro" camera) comprises an outsize camera, projector house combined drawing holder and enlarging easel, anti-vibration mat and the lighting—by 8, 12 or 16 Osram fluorescent lamps. The illustration shows how the lighting is applied. By means of the special camera, which moves on a track fitted with anti-vibration mat, reproductions of the drawings, reduced to card index size, can be obtained.

By this means hundreds of drawings can be conveniently fitted in a limited space, and from the negatives enlargements, the scale of which can be varied at will, can be obtained.



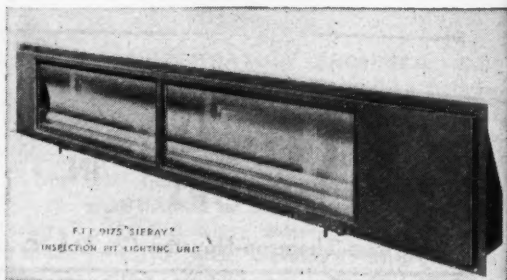
Public Works Exhibition

It has been pleasant to note the revival of the Public Works, Roads and Transport Exhibition, which took place at Olympia during July 21—26. The exhibition included displays of street lighting equipment by a number of firms in the lighting industry. A comprehensive range of street lighting fittings for use on main and side roads in accordance with the Ministry of Transport recommendations was on show, an indication that firms are preparing to supply up-to-date equipment as soon as the present restrictions on street lighting are removed. Of interest were lanterns for use with tubular fluorescent lamps, which were shown by the British Thomson-Houston Co., Ltd., and the General Electric Co., Ltd.

Siemens Electric Lamps and Supplies, Ltd., in addition

to other lighting exhibits, showed a new fluorescent inspection pit lighting unit designed for flush fitting in the side of an inspection pit. This provides a highly concentrated light on the underside of the vehicle, making the use of hand lamps unnecessary (see illustration).

Other exhibits included illuminated road traffic signs and reflecting road studs, and similar transport accessories.



F.T.T. 1975 "STIRRAY"
INSPECTION PIT LIGHTING UNIT

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